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DAVIS, J. G.		
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HANNI, B. J.		
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HEDAH, T.		
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WYANT, R. B.		
AL ERUGH	✓	✓
J. K. HOPKINS	✓	✓
R. E. MADEZ	✓	✓
P. J. LARSEN	✓	✓
CORRESP CONTROL	X	X
ADMIN RECORD	✓	✓
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# EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC

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January 5, 1994

94-RF-0089

Scott R. Grace  
Environmental Restoration Division  
DOE, RFO

## QUARTERLY REPORT FOR BIOREMEDIATION TREATABILITY STUDY TASK - JKH-005-94

This report summarizes the progress made on the Bioremediation task (Work Package Number: 12192; Activity Number: 11200) during the first quarter of Fiscal Year 1994. A baseline schedule is attached. The activities that have taken place include the following: progress on the workplan and scope definition; meetings held to delineate the interest and involvement of representatives from the Department of Energy (DOE) and their oversight contractors, EG&G Rocky Flats, Los Alamos Technical Office (LATO), and the local universities; and progress toward mobilization of laboratory facilities.

Work under this activity to be accomplished in Fiscal Year 1994 will focus on biodegradation of chlorinated solvents from subsurface soils. The work will address the treatability study requirements associated with the potential excavation and treatment of soil from Operable Unit No. 2 (OU 2), Individual Hazardous Substance Site (IHSS) 110, contaminated with organics and potentially Non-Aqueous Phase Liquids (NAPLs). The work to be accomplished in the second quarter of FY 94 includes finalizing the workplan, setting up the on-site laboratory facilities and obtaining environmental samples from IHSS 110.

## WORKPLAN

The workplan is split into three chapters. Chapter One describes the literature associated with bioremediation in general. This chapter gives a brief overview of bioremediation processes, contaminants that can be degraded by biological activity, the mechanisms of degradation, and a research overview in government, universities and the private sector. This chapter is complete pending approval of controlling reviewers and DOE.

Chapter Two presents an overview of contaminant distribution at Rocky Flats. This chapter describes the occurrence of contaminants thought to exist in major quantities within Operable Units and to some extent within Individual Hazardous Substance Sites on the plant site. This chapter is also complete pending approval of controlling reviewers and DOE.

ADMIN RECORD

Chapter Three provides detail for the contaminants that will be evaluated for bioremediation in this study. This chapter provides specific literature related to those contaminants and details about the mechanisms of degradation and the expected degradation products. The methodology associated with the study is reviewed and includes the type and number of samples, the procedures to be followed and the expected results. This chapter is in draft form, pending revision and final review by the EG&G project manager.

## **MEETINGS and RELATED RESEARCH**

### **Meetings**

Several meetings have been held to discuss performing bioremediation at Rocky Flats. The meetings were intended to obtain assistance with the scope definition as it relates to the work performed by EG&G, specifically, Environmental Engineering and Technology (EE&T), Environmental Development (ED) (formerly Technology Development) and Ecology and NEPA Division (END).

### **Biodenitrification**

The Colorado School of Mines (CSM) and the University of Colorado (CU) have proposed to LATO to perform field-scale, pilot-scale biodenitrification of RFP Solar Pond water and sludge. LATO has expressed some interest in exploring biodenitrification as a plant-wide remedial action. Work on that activity is being pursued by the LATO representative.

### **Plutonium Dissolution by Bacteria**

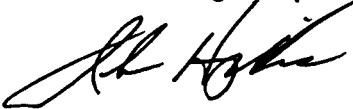
Part of a treatability study that was performed for EG&G by LANL involved the use of plutonium contaminated Rocky Flats soil, taken from the buffer zone in OU 2, for dissolution of Pu using bacteria developed by a company called MBX, Inc. The results ranged from 0%-80% removal of Pu from the test soil. The test conditions were not provided to EG&G by MBX, Inc. and the results were obtained only after EG&G signed a proprietary agreement with MBX, Inc. The potential for this remediation technique to prove successful does exist, however; the conditions under which MBX, Inc. would perform research for EG&G would be very restrictive. At this time, EG&G will not pursue further research of the Pu dissolution with MBX, Inc.

## **LABORATORY FACILITIES**

The representative from ED has been making progress on obtaining laboratory space and procuring the appropriate laboratory equipment for performing bioremediation studies at RFP. The lab space is available and is being outfitted with analytical equipment, glassware and surrogate contaminants, if they are necessary. Applicable documents for this task include the Job Safety Analysis and the Waste Guidance document, which will be written during the second quarter. EE&T will also begin work on the Quality Assurance Addendum in the second quarter.

S. R. Grace  
January 5, 1993  
JKH-005-94  
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For further information regarding Bioremediation work under the Sitewide Treatability Studies Program, please contact Robin E. Madel of EE&T at 966-6972.



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REM.cb

Orig and 1 cc - S. R. Grace

Attachment.  
As Stated

cc:

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